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| 7.1 The student will  a) investigate and describe the concept of negative exponents for powers of ten;  b) determine scientific notation for numbers greater than zero;  c) compare and order fractions, decimals, percents and numbers written in scientific notation;  d) determine square roots; and  e) identify and describe absolute value for rational numbers. | |
| **HINTS & NOTES**  **Scientific Notation:**  To write a number in scientific notation, you write the number as two factors.  -Move the decimal to the left to make a factor between 1 and 10 (so that there is only one number to the left of the decimal).  -The exponent will be the number of places that you moved the decimal.  Example: 25,000,000 = 2.5 x 107  To write a number in standard form, you move the decimal point to the right as many places as the exponent. Put 0 in any space.  Example: 3.4 x 105 = 340,000  **Steps for ordering numbers**:  1. Change all of the numbers to decimals.  2. Line up the decimals.  3. Add on zeros until the numbers are the same length. (same number of digits)  4. Ignore the decimals and put them in order.  \*\*Remember to look for the order that the questions asks. (L →G or G→L)  **To change a decimal to a percent** → move the decimal to the right (→) two places.  Example: .234 = 23.4%  **To change a fraction to a percent** → divide the numerator (top number) by the denominator (bottom number). Move the decimal to the right (→) two places.  Example: =.375 = 37.5%  **To change a fraction to a decimal** → divide the numerator (top number) by the denominator (bottom number).  Example: =.375  **To change a decimal to a fraction** → write the fraction as you would say it. Then simplify!  Example: 0.225 you read as “two hundred twenty-five thousandths”, so . Now reduce (divide both the top and bottom by the GCF of 25), and you get 0.225 = | **PRACTICE**   |  |  | | --- | --- | | **Test** | **Score** | | 1 |  | | 2 |  | | 3 |  | | 4 |  |   **1. Mike wrote the fractional part of the tests he answered correctly. Which lists these test scores in order from least to greatest?**  **A. , , ,**  **B. , , ,**  **C. , , ,**  **D. , , ,**  **2. A company sold for 26 million dollars. What is 26 million expressed in scientific notation?**  **F.** 2.6 x 106 **H.** 2.6 x 107  **G.** 2.6 x 108 **J.** 2.6 x 109  **3. As Sam walked through the mall he passed store with a sign that read “Going Out of Business Sale. Everything is  off.” What percent is ?**   * 1. 42.9% **C.** 57.1%   2. 71.4% **D.** 90%   **4. As Sam walked through the mall he passed store with a sign that read “Going Out of Business Sale. Which is the least number in this list?** **1, 2, 1.6, , 0.794**   1. 1.6 **H.** 0.794 2. **J.** 1   **5. Which shows 346,000,000 written in scientific notation?**  **A.** 346 x 106 **C.** 346 x 108  **B.** 3.46 x 108 **D.** 34.6 x 107    **6. Which shows 0.175 as a fraction in simplest form?**  **F.  H.**  **G.  J.**  **7. Write an equivalent fraction and decimal to the number given.**   |  |  |  | | --- | --- | --- | | **Given Number** | **Fraction** | **Decimal** | |  |  |  |   **8. Write the square root of 144 in the box provided.**  **9. Circle all the true statements about absolute value.**    The absolute value of a positive number is always positive  The absolute value of a number is determined by its distance from zero.  and  have equivalent absolute values. |
| Skills Checklist  *I can…*   * Recognize powers of 10 with negative exponents by examining patterns. * Write a power of 10 with a negative exponent in fraction and decimal form. * Write a number greater than 0 in scientific notation. * Recognize a number greater than 0 in scientific notation. * Compare and determine equivalent relationships between numbers larger than 0, written in scientific notation. * Represent a number in fraction, decimal, and percent forms. * Compare, order, and determine equivalent relationships among fractions, decimals, and percents. Decimals are limited to the thousandths place, and percents are limited to the tenths place. Ordering is limited to no more than 4 numbers. * Order no more than 3 numbers greater than 0 written in scientific notation. * Determine the square root of a perfect square less than or equal to 400. * Demonstrate absolute value using a number line. * Determine the absolute value of a rational number. * Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle to solve practical problems.† | |
| 7.2 The student will describe and represent arithmetic and geometric sequences using variable expressions. | |
| **HINTS & NOTES**  **Arithmetic Sequence –**  A sequence where you add the same number to each term to get the next term.  \*\*The number added is called the **common difference**.\*\*  If the numbers are getting bigger, the common difference is a positive number.  If the numbers are getting smaller, the common difference is a negative number.  **Geometric Sequence –**  A sequence where you multiply each term by the same number to find the next term.  \*\*The number multiplied by each time is called the **common ratio.**\*\*  If the numbers are getting bigger, the common ratio is greater than 1.  If the numbers are getting smaller, than the common ratio is less than 1. | **PRACTICE**  **1. What is the common difference of the arithmetic sequence shown below?**  **-4, -1, 2, 5, …**     1. 2 2. 3 3. 4 4. 5   **2. What is the 5th term of the geometric sequence shown?**  **80, 40, 20, …**  **F.** 10  **G.** 5  **H.** 2.5  **J.** 1  **3. Which rule was used to make this pattern?**  **0.002, 0.02, 0.2, 2, …**  **A.** Multiply by 10.  **B.** Multiply by 0.2.  **C.** Divide by 100.  **D.** Divide by 10.  **4. What is the next number in this pattern?**  **, , , , …**  **F.  H.**  **G.  J.**  **5. Write a variable expression in the box provided to describe the common difference of the arithmetic sequence shown below?**  **-5, -1, 3, 7,…**  **6. What is the 6th term of the geometric sequence shown, write your answer in the box provided?**  **160, 80, 40, …**  **7. What is the missing number in this pattern?**  **4, 2, 1, 0.5, 0.25, \_\_\_, 0.0625** |
| Skills Checklist  *I can…*   * Analyze arithmetic and geometric sequences to discover a variety of patterns. * Identify the common difference in an arithmetic sequence. * Identify the common ratio in a geometric sequence. * Given an arithmetic or geometric sequence, write a variable expression to describe the relationship   between two consecutive terms in the sequence. | |
| 7.3 The student will a) model addition, subtraction, multiplication and division of integers; and b) add, subtract, multiply, and divide integers. | |
| **HINTS & NOTES**  **Adding integers –**  Signs alike – keep the sign and add  Signs different – take the sign of the larger number and subtract  Example:-4 + -2= -6  or -4 + 2 = -2  **Subtracting integers –**  Change the subtraction sign to addition and change the sign of the second integer. Follow the rules for adding.  Example: -4 – (-2) becomes -4+ 2 which = -2  **Multiplying and Dividing Integers** **–**  Signs alike – positive answer  Signs different – negative answer | **PRACTICE**  **1. During a winter’s day, the low temperature was recorded at 21oF. The wind-chill temperature that same day was -8oF. What was the difference between the wind-chill temperature and the low temperature?**   1. **8o** 2. **13o** 3. **25o** 4. **29o**   **2.**    **Using the key above as a guide, what is the result of the operation in the model below?**      **+**  **F.** -10  **G.** -2  **H.** 2  **J.** 10  **3. 5 + (-8) – 15 =**   1. -28 2. -18 3. -12 4. -2   **4. Carrie represented a problem her teacher provided her on the board using the number line below. Which problem had her teacher given her?**    **F** -6 + -6  **G** -12 + 12  **H** -2(-6)  **J** -12 ÷ -2 |
| Skills Checklist  *I can…*   * Model addition, subtraction, multiplication and division of integers using pictorial representations of   Concrete manipulatives.   * Add, subtract, multiply, and divide integers. * Simplify numerical expressions involving addition, subtraction, multiplication and division of integers using order of operations. * Solve practical problems involving addition, subtraction, multiplication, and division with integers. | |
| 7.4 The student will solve single-step and multistep practical problems, using proportional reasoning. | |
| **HINTS & NOTES**  **Discount –** subtract from total  **Sales tax –** add to total  **Tip –** add to total  **Interest -** add to total  **To find a percent of something** → change the percent to a decimal and multiply.  Example: 20% of $150  .2 X 150 = 30, so 20% of $150 is $30.  **\*\* Remember\*\***  **To change a percent to a decimal**→ move the decimal two places to the left (←)  **When setting up a proportion** – make sure that the numerators and denominators match.  Example:    **To solve a proportion –**  Cross multiply | **PRACTICE**  **1. Jessica answered 9 of the 12 questions on her test. What percent of the questions did Jessica answer?**   1. 60% 2. 75% 3. 85% 4. 90%   **2. The Jones’ bill at a restaurant is $42.00. How much money should Mr. Jones leave as a tip if he plans to tip 15%?**    **F.** $49.30  **G.** $35.70  **H.** $6.30  **J.** $2.80  **3. Bill put $2,500 in a savings account at an annual interest rate of 4%. If Bill does not deposit or withdraw any money, what is the amount of interest Bill will earn the first year his money is in the savings account?**  **A.** $100  **B.** $625  **C.** $1000  **D.** $2600  **4. Beth sent 18 packages that each weighed 3.085 pounds. Estimate the total weight of all of Beth’s packages.**  **F.** 60 lb  **G.** 43 lb  **H.** 35 lb  **J.** 6 lb  **5. Terri was looking at a map with the following scale indicator.**  inch = 4 miles  **Terri measured** 2 **inches between two cities on the map. What is the distance in miles between the two towns?**   1. 19 miles 2. 16 miles 3. 8 miles 4. 8 miles   **6. What is the missing term in this proportion?**  **=**  **A.** 5  **B.** 6  **C.** 20  **D.** 22.5  **7. The ratio of girls to boys is 3 to 7. If there are 21 girls, write a proportion to help you determine how many boys are there?**    **8. Solve for x, and write the correct answer in the blank. Round to the nearest tenth.**  **=**  **9. Choose all the proportion that could be used to solve this problem:**  **In a survey of 65 students, 3 out of 5 said PE was their favorite**  **class. How many students said PE was their favorite class?**    **10. If five people shared 8pounds of steamed shrimp for dinner. How many pounds of shrimp did one person eat? Round your answer to the nearest pound.** |
| Skills Checklist  *I can…*   * Write proportions that represent equivalent relationships between two sets. * Solve a proportion to find a missing term. * Apply proportions to convert units of measurement between the U.S. Customary System and the metric system. * Apply proportions to solve practical problems, including scale drawings. Scale factors shall have denominators no greater than 12 and decimals no less than tenths**.** * Using 10% as a benchmark, mentally compute 5%, 10%, 15%, or 20% in a practical situation such as tips, tax and discounts. * Solve problems involving tips, tax, and discounts. Limit problems to only one percent computation per problem. | |
| 7.5 The student will a) describe volume and surface area of cylinders; b) solve practical problems involving the volume and surface area of rectangular prisms and cylinders; and c) describe how changing one measured attribute of a rectangular prism affects its volume and surface area. | |
| **HINTS & NOTES**  **\*\*Use the formula sheet at all times\*\***  **Use the formulas exactly as they are on the sheet.**  **Don’t forget to check the units:**  Squared units for area and cubed units for volume.  **Surface area –** amount needed to cover something  **Volume –** amount needed to fill something  **Changing Attributes**  There is a direct relationship between changing one  measured attribute of a rectangular prism by a scale  factor and its volume.  For example, **doubling** the  length of a prism will **double** its volume.  This direct relationship does not hold true for surface area. | **PRACTICE**  **1. A cylinder-shaped can has a diameter of 4 feet and a height of 4.5 feet. If the can is empty, which is closest to the minimum amount of water needed to completely fill the can?**   1. 32 cu ft 2. 49 cu ft 3. 57 cu ft 4. 1,145 cu ft   **2. Lindsay is wrapping a birthday gift in a rectangular prism-shaped box with gift wrap.**    **What is the minimum amount of gift wrap Lindsay needs to cover the entire box?**  **F.** 96 sq in.  **G.** 136 sq in.  **H.** 192 sq in.  **J.** 272 sq in.  **3. This rectangular prism is built with 1-inch cubes. What is the volume?**    5 in  2 in  8 in   1. 10 in.3 2. 20 in.3 3. 40 in.3 4. 80 in.3   **4. Crunch and Munch cereal is designing a new box. How much cardboard is needed to create the box if the height is 4 cm., the length is 5 cm., and the width is 2.5 cm.?**  **F.** 23 cm.2  **G.** 42.5 cm.2  **H.** 50 cm.2  **J.** 85 cm.2  **5. Find the volume of a rectangular prism with a length of 6 in., width of 2 in., and height of 4 in.**  **A.** 12 in.3  **B.** 24 in.3  **C.** 48 in.3  **D.** 64 in.3  **6. The volume of this prism is 960 cubic inches, what is the height?**  **7. Keith has is thinking about creating a cube that measures 5 cm per edge. Describe the volume of this cube in comparison to a cube with 10 cm per edge. Use the space below for your answer.** |
| Skills Checklist  *I can…*   * Determine if a practical problem involving a rectangular prism or cylinder represents the application of volume or surface area. * Find the surface area of a rectangular prism. * Solve practical problems that require finding the surface area of a rectangular prism. * Find the surface area of a cylinder. * Solve practical problems that require finding the surface area of a cylinder. * Find the volume of a rectangular prism. * Solve practical problems that require finding the volume of a rectangular prism. * Find the volume of a cylinder. * Solve practical problems that require finding the volume of a cylinder. * Describe how the volume of a rectangular prism is affected when one measured attribute is multiplied by a scale factor. Problems will be limited to changing attributes by scale factors only. * Describe how the surface area of a rectangular prism is affected when one measured attribute is multiplied by a scale factor. Problems will be limited to changing attributes by scale factors only. | |
| 7.6 The student will determine whether plane figures – quadrilaterals and triangles – are similar and write proportions to express the relationships between corresponding sides of similar figures. | |
| **HINTS & NOTES**  **Similar figures –** same shape but different size. Their corresponding angles have the same measure and their corresponding sides are proportional. This means that the ratios of corresponding sides are equal.  **Remember –** to solve a proportion – cross multiply.  The symbol **~** means ***is similar to.*** | **PRACTICE**  **1. Triangle FOX is similar to triangle FAN.**    **Which side of the triangle FOX corresponds to side FA?**         **2. Which of these is a set of similar polygons?**  **F.** all rectangles  **G.** all trapezoids  **H.** all right triangles  **J.** all equilateral triangles  **3. ∆ABC is similar to ∆XYZ. AB = 15 and XY = 25. If YZ = 15, what is the measure of ?**   1. 5 2. 9 3. 10 4. 12   **4. Find x for each set of similar figures below.**  **a.**  **b.**  **5. Select all the true statements regarding the similar figures represented below.**      **6.**    **If ΔABC is similar to ΔADE, then = . Which segment replaces the “?” to make the statement true? Write the segment name in the box.** |
| Skills Checklist  *I can…*   * Identify corresponding sides and corresponding and congruent angles of similar figures using the traditional notation of curved lines for the angles. * Write proportions to express the relationship between the lengths of corresponding sides of similar figures. * Determine if quadrilaterals or triangles are similar by examining congruence of corresponding angles and proportionality of corresponding sides. * Given two similar figures, write similarity statements using symbols such as Δ*ABC* ~ Δ*DEF* ,∠ *A*   corresponds to ∠*D*, and corresponds to . | |
| 7.7 The student will compare and contrast the following quadrilaterals based on properties: parallelogram, rectangle, square, rhombus, and trapezoid. | |
| **HINTS & NOTES**  **Quadrilateral –** polygon w/ 4 sides   |  |  | | --- | --- | | **Quadrilateral** | **Properties** | | Parallelogram | ▪ both pairs of opposite sides are congruent (equal in length)  ▪ both pairs of opposite sides are parallel  ▪ both pairs of opposite angles are congruent (equal in measure) | | Rectangle | ▪ both pairs of opposite sides are congruent (equal in length)  ▪ both pairs of opposite sides are parallel  **▪** all four interior angles measure 90o (right angles) | | Square | ▪ both pairs of opposite sides are parallel  ▪ all four sides are equal  **▪** all four interior angles measure 90o (right angles) | | Rhombus | ▪ both pairs of opposite sides are parallel  ▪ all four sides are equal | | Trapezoid | **▪** one pair of opposite sides are parallel and the other pair are not | | **PRACTICE**  **1.**  **If all four angles of the polygon pictured measure 90o, then the polygon is most likely a –**   1. square 2. rhombus 3. rectangle 4. nonagon   **2. If all sides of the polygon pictured are NOT equal in length, the polygon is most likely a –**  **F.** rectangle  **G.** parallelogram  **H.** trapezoid  **J.** rhombus  **3. Which polygon is NOT a quadrilateral?**    **4. Identify all the possible classifications of the figure provided, given its characteristics.**    **5. Quadrilateral ABCD is a parallelogram. Which two segments must be parallel?**  **A.**  **B.**  **C.**  **D.**  **6. How are a square and a rhombus alike?**  **F.** They have no acute angles.  **G.** They are both trapezoids.  **H.** They both have four congruent angles.  **J.** They both have four congruent sides.  **7. Beth planted a garden in her backyard. What is the best name for the shape of the garden?**     1. Triangle 2. Quadrilateral 3. Pentagon 4. Hexagon   **8. Create a diagram or graphic organizer comparing the similarities and differences between quadrilaterals.** |
| Skills Checklist  *I can…*   * Compare and contrast attributes of the following quadrilaterals: parallelogram, rectangle, square, rhombus, and trapezoid. * Identify the classification(s) to which a quadrilateral belongs, using deductive reasoning and inference. | |
| 7.8 The student, given a polygon in the coordinate plane, will represent transformations (reflections, dilations, rotations, and translations) by graphing in the coordinate plane. | |
| **HINTS & NOTES**  **Translation =** SLIDE  **Rotation =** TURN  **Clockwise =**  **Counter-**  **clockwise =**  **Horizontal =**  **Vertical =** | **PRACTICE**  **1. Translate the figure horizontally -3 units.**    **Which best describes the location of the image of the vertex L?**   1. ( -1, -2) 2. (2, -5) 3. (5, -2) 4. (2, 1)   **2. Reflect  over x- axis and write the new coordinates in the boxes provided.**    **3. Rotate rectangle ABCD 180˚, and sketch the new image.**    **4. William dilated triangle PQR by a scale factor on the coordinate plane to the right. Select the scale factor used.** |
| Skills Checklist  *I can…*   * Identify the coordinates of the image of a right triangle or rectangle that has been translated either vertically, horizontally, or a combination of a vertical and horizontal translation. * Identify the coordinates of the image of a right triangle or rectangle that has been rotated 90° or 180° about the origin. * Identify the coordinates of the image of a right triangle or a rectangle that has been reflected over the x- or y-axis. * Identify the coordinates of a right triangle or rectangle that has been dilated. The center of the dilation will be the origin. * Sketch the image of a right triangle or rectangle translated vertically or horizontally. * Sketch the image of a right triangle or rectangle that has been rotated 90° or 180° about the origin. * Sketch the image of a right triangle or rectangle that has been reflected over the x- or y-axis. * Sketch the image of a dilation of a right triangle or rectangle limited to a scale factor of | |
| 7.9 The student will investigate and describe the difference between the experimental probability and theoretical probability of an event. | |
| **HINTS & NOTES**  **Theoretical Probability-** is what you expect to happen in theory.  **Experimental Probability-** is determined through an actual simulation of events.  **Always** write probability as a fraction first **()**  then change it to a decimal or percent if needed.  **Number cubes** and **dice** are the same thing**.** | **Practice**  **1. A regular card deck contains 52 cards, 4 of which are kings. Assuming that the cards are dealt randomly, what is the probability that the first card dealt will be a king?**  **A.**  **B.**  **C.**  **D.**  **2. The six faces of a fair cube are numbered 1 through 6. If the cube is rolled 300 times, what is the expected number of times a 5 will land face up?**  **F.** 50  **G.** 100  **H.** 200  **J.** 250  **3. Ryan has a basket of 20 blue marbles and 15 red marbles. What is the probability that the next marble he randomly chooses will be blue?**  **A.**  **B.**  **C.**  **D.**  **4. Andrew roles a number cube 100 times. The results are shown below. After reviewing the table identify for which face the experimental probability was closest to the theoretical probability.**   |  |  | | --- | --- | | **Face** | **# of times face was rolled** | | **1** | **25** | | **2** | **10** | | **3** | **15** | | **4** | **20** | | **5** | **22** | | **6** | **8** | |
| Skills Checklist  *I can…*   * Determine the theoretical probability of an event. * Determine the experimental probability of an event. * Describe changes in the experimental probability as the number of trials increases. * Investigate and describe the difference between the probability of an event found through experiment or simulation versus the theoretical probability of that same event. | |
| 7.10 The student will determine the probability of compound events, using the Fundamental (Basic) Counting Principle. | |
| **HINTS & NOTES**  **Sample space** – the set of all possible outcomes  **Tree diagram –** a visual way to show a sample space  **Example:** If you toss a coin twice, what are the possible outcomes?  Coin 1 Coin 2 Outcomes  H HH  H  T HT  H TH  T  T TT  **Fundamental Counting Principal –** If there are *m* ways of making one choice and *n* ways of making a second choice, then there are *m* x *n* ways of making the first choice followed by the second. | **PRACTICE**  **1. A local deli offers different choices as part of their lunch combo.**     |  |  |  | | --- | --- | --- | | **Lunch Choices** | | | | **Main Dish** | **Side** | **Drink** | | **Hamburger**  **Turkey sandwich**  **Chicken Strips** | **Salad**  **Fruit** | **Milk**  **Iced Tea**  **Juice** |   **How many different lunch combinations consisting of 1 main dish, 1 side dish, and 1 drink are possible?**   1. 6 2. 9 3. 18 4. 27   **2. The new town restaurant offers a dinner special that consists of a main dish, a vegetable, a salad, and a roll. There are 5 main dishes, 6 vegetables, 1 salad, and 1 roll to choose from. Which shows the total number of dinner special combinations?**  **F.** 5 + 6 + 1 + 1  **G.** 5 x 6 x 2  **H.** 5 + 6  **J.** 5 x 6 x 1 x 1  **3. Meredith has a job wrapping boxes at a store. She can choose from 3 different types of wrapping paper, 6 colors of ribbon, and 4 different bows. How many gift-wrapping options are there?**  **A.** 13  **B.** 22  **C.** 72  **D.** 144  **4.** **The teacher puts 4 red, 3 green, and 6 white marbles in a bag. What is the chance of pulling out a marble and getting a yellow marble?**  **F.** 0  **G**. 1  **H.** 3  **J.** 4  **5. Kase is packing for Disney World. He is taking 5 pairs of shorts and 7 shirts. How many different outfit combinations can he wear? Write your answer in the blank.** |
| Skills Checklist  *I can…*   * Compute the number of possible outcomes by using the Fundamental (Basic) Counting Principle. * Determine the probability of a compound event containing no more than 2 events. | |
| 7.11 The student, given data in a practical situation, will a) construct and analyze histograms; and  b) compare and contrast histograms with other types of graphs presenting information from the same data set. | |
| **HINTS & NOTES**  **Histograms –** used to display data that have been grouped into intervals.  **Frequency distribution** – lists items together with the number of times, or frequency, that they occur.  **Box-and-whisker plots –**  Shows the distribution of data in each quartile. The line in the box is the median. To find the range, subtract the largest number from the smallest number.  **Line graph** – shows change over time  **Line plot** – uses a number line to display data  **Stem-and-leaf plot –**  displays data items in order. A leaf is the item’s last digit. | **Practice**  **1. Using the Histogram below, identify all the true statements.**  9 boxes contain at least 20 fish.  More boxes contain 10-19 fish  than 0-9.  4 boxes contain 30-39 fish  **2. Carlos, Miguel and Mitch competed in a three-point shooting competition. Each participant had 50 chances. The boys recorded the number of shots made out of the 50 attempts for all the competitors.**  **Three Point Shooting Contest (# of shots made out of 50 attempts)**  **7, 28, 36, 19, 16, 49, 16, 36, 29, 1, 7, 5, 23, 28, 47, 1**  **Create a histogram and describe the data. *(What might happen if 10 more participants go? Is there a pattern? Etc.)*** |
| Skills Checklist  *I can…*   * Collect, analyze, display, and interpret a data set using histograms. For collection and display of raw data, limit the data to 20 items. * Determine patterns and relationships within data sets (e.g., trends). * Make inferences, conjectures, and predictions based on analysis of a set of data. * Compare and contrast histograms with line plots, circle graphs, and stem-and-leaf plots presenting information from the same data set. | |
| 7.12 The student will represent relationships with tables, graphs, rules, and words. | |
| **HINTS & NOTES**  **Relation-** is a set of ordered pairs.  **Remember** to always start from the **origin.**  **Origin** is **(0,0)**  **Move horizontally (↔) first and then move vertically (↕).**  **Ordered pair –** (x, y)  Quadrant Quadrant  II I    Quadrant Quadrant  III IV  **Rules-** describe a relationship between two sets of numbers with a table, graph, word sentence or equation. | **Practice**  **1. Which equation is true for all values in the table.**   |  |  | | --- | --- | | **X** | **Y** | | **-1** | **3** | | **2** | **-6** | | **4** | **-12** |   **A.**  **B.**  **C.**  **D.**  **2. Create a table to match the coordinates given in the picture below.**     |  |  | | --- | --- | | **X** | **Y** | |  |  | |  |  | |  |  | |  |  | |  |  |   **3. The output value(y) of a function is equal to the input value(x) divided by three. Write an equation to represent this relation.**  **Y=** |
| Skills Checklist  *I can…*   * Describe and represent relations and functions, using tables, graphs, rules, and words. * Given one representation I can represent the relation in another form. | |
| 7.13 The student will a) write verbal expressions as algebraic expressions and sentences as equations and vice versa; and b) evaluate algebraic expressions for given replacement values of the variables. | |
| **HINTS & NOTES**  **Sum –** add  **Total –** add  **Increased by –** add  **Difference –** subtract  **Less than –** subtract  **Decreased by –** subtract  **Product of –** multiply  **Times -** multiply  **Quotient of –** divide  **Twice –** multiply by 2  **REMEMBER** – 7 less than a number means *n-7* **NOT** *7-n*  An **expression** is like a phrase, while an **equation** is like a sentence.  **Equation –** a statement in which two expressions are shown to be equal.  **Inequality –** a comparison of two expressions that uses one of the symbols ≤, ≥, <, >, and ≠.  **Expression –** a group of numbers, variables, and operations that express a numerical relationship. | **PRACTICE**  **1. Which represents the phrase shown?**  ***The product of three and a number, decreased by 2***   1. 3(x - 2) 2. 3(2 – x) 3. 2 – 3x 4. 3x – 2   **2. Which phrase best represents the following?**  **4x – 6**  **F.** Six less than four times a number.  **G.** Four times a number less than six.  **H.** Six less than a number squared.  **J.** A number squared less than six.  **3.**  **Twice the number of students in Tim’s class divided by five is ten.**  **Which best represents the sentence above?**  **A.**  = 10  **B.** = 10  **C.**  + 10  **D.** + 10  **4. Select all the expressions below.**    **5. Identify all the statements that are false.**    **6. What phrase best represents the following?**  **2x + 7**  **F.** Seven more than twice a number  **G.** Seven more than a number squared  **H.** A number squared more than Seven  **J.** Two plus a number seven.  **7. Evaluate t*hree more than twice x,* if x=-4. Write your answer in the box provided.**  **8. Write an expression for *five less than one-third x*, in the box.**  **9. Evaluate , if x=-8. Write your answer in the box.**  **10. Create your own word sentence and then write the equivalent equation.** |
| Skills Checklist  *I can…*   * Write verbal expressions as algebraic expressions. Expressions will be limited to no more than 2 operations. * Write verbal sentences as algebraic equations. Equations will contain no more than 1 variable term. * Translate algebraic expressions and equations to verbal expressions and sentences. Expressions will be limited to no more than 2 operations. * Identify examples of expressions and equations. * Apply the order of operations to evaluate expressions for given replacement values of the variables. Limit the number of replacements to no more than 3 per expression. | |
| 7.14 The student will a) solve one and two-step linear equations in one variable; and b) solve practical problems requiring the solution of one and two-step linear equations. | |
| **Hints & Notes**  **To Solve**  **Isolate the variable** Use inverse operations. An operation that is performed on one side must be done on the other side as well.  **To Check**  **Plug it in! Plug it in!**  For any problem involving solving an equation or an inequality, plug in all of the answer choices until you find the one that works. | **Practice**  **1. What is the value of *k* that makes the following true?**  ***k* – (-2) = 6**   1. -8 2. -4 3. 4 4. 8   **2. Which equation is represented by the model below?**    **F.** 3x=9  **G.** 1x + 2x = 9  **H.** x-3=9  **J.** 2x + 3 = 9  **3. Solve each equation below and write your solution in the box.**  **a.** 4f=28  **b.** -3y=-15  **c.** -11=n-2  **4. Identify all equations below that have a solution of -2.** |
| Skills Checklist  *I can…*   * Represent and demonstrate steps for solving one and two-step equations in one variable using concrete materials, pictorial representations and algebraic sentences. * Solve one and two-step linear equations in one variable. * Solve practical problems that require the solution of a one or two-step linear equation. | |
| 7.15 The student will a) solve one-step inequalities in one variable; and b) graph solutions to inequalities on the number line. | |
| **Hints & Notes**  **To Solve**  **Isolate the variable** Use inverse operations. An operation that is performed on one side must be done on the other side as well.  ***If you MULTIPLY or DIVIDE both sides of an INEQUALITY by a NEGATIVE number you must REVERSE the comparison sign☺***  **To Check**  **Plug it in! Plug it in!**  For any problem involving solving an equation or an inequality, plug in all of the answer choices until you find the one that works. | **Practice**  **1. Solve < 4, and graph on the number line provided.**   1. x < -8 2. x > -8 3. x < -2 4. x > -2     **2. Select all the values for *t* that make the following true?**  **t + 6 ≥ 4**    **3. Solve each of the following inequalities and write your answer in the box provided and graph on the number line.** |
| Skills Checklist  *I can…*   * Represent and demonstrate steps in solving inequalities in one variable, using concrete materials, pictorial representations, and algebraic sentences. * Graph solutions to inequalities on the number line. * Identify a numerical value that satisfies the inequality. | |
| 7.16 The student will apply the following properties of operations with real numbers: a) the commutative and associative properties for addition and multiplication; b) the distributive property; c) the additive and multiplicative identity properties; d) the additive and multiplicative inverse properties; and e) the multiplicative property of zero**.** | |
| **HINTS & NOTES**  **Commutative** – switches places (commutes)  a + b = b + a  a ∙ b = b ∙ a  **Associative** – switches groups (associates w/ different “people”)  a + (b + c) = (a + b) + c  a ∙ (b ∙ c) = (a ∙ b) ∙ c  **Distributive** –  a(b + c) = ab + ac  **Identity** – the starting identity does not change.  a + 0 = a  a ∙ 1 = a  **Inverse** – adding or multiplying by the “opposite” or reciprocal  a + -a = 0  a ∙ = 1  **Multiplicative Property of Zero** – if you multiply by 0 then your answer is 0.  a ∙ 0 = 0 | **PRACTICE**  **1.** **∙ x = 1**  **If the number sentence is true, then x is the –**   1. additive identity 2. additive inverse 3. multiplicative identity 4. multiplicative inverse   **2. Which number sentence illustrates the commutative property of multiplication?**  **F.** 12 + (10 ∙ 5) = 12 + (5 ∙ 10)  **G.** 12 + (10 ∙ 5) = 10 + (12 ∙ 5)  **H.** 12 + (10 ∙ 5) = 12 ∙10 + 12 ∙ 5)  **J.** 12 + (10 ∙ 5) = (12 + 10) ∙ 5  **3. Choose the number that completes this statement of the Associative Property.**  **16 • (24 • 15) = (16 • 24) •**   1. 15 2. 16 3. 24 4. 240   **4. Jane is simplifying the following expression. Write the property she used the box to the right of each step.** |
| Skills Checklist  *I can…*   * Identify properties of operations used in simplifying expressions. * Apply the properties of operations to simplify expressions. | |